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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/620,002	07/14/2003	Dinesh Chopra	2269-4373.2US (00-0036.02	7481

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EXAMINER	
UMEZ ERONINI, LYNETTE T	
ART UNIT	**PAPER NUMBER**
1765	

DATE MAILED: 11/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Advisory Action Before the Filing of an Appeal Brief	**Application No.** 10/620,002	**Applicant(s)** CHOPRA ET AL.	
	Examiner Lynette T. Umez-Eronini	**Art Unit** 1765	

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 27 October 2006 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:
   a) ☐ The period for reply expires _____months from the mailing date of the final rejection.
   b) ☒ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

   Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☒ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   (a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);
   (b) ☐ They raise the issue of new matter (see NOTE below);
   (c) ☒ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   (d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

   NOTE: _____. (See 37 CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicant's reply has overcome the following rejection(s): _____.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☒ For purposes of appeal, the proposed amendment(s): a) ☒ will not be entered, or b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.
   The status of the claim(s) is (or will be) as follows:
   Claim(s) allowed: *none*.
   Claim(s) objected to: *none*.
   Claim(s) rejected: *1-25*.
   Claim(s) withdrawn from consideration: *none*.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing a good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: See Continuation Sheet.
12. ☒ Note the attached Information Disclosure Statement(s). (PTO/SB/08) Paper No(s). 8/28/2006
13. ☐ Other: _____.

SHAMIM AHMED
PRIMARY EXAMINER

Continuation of 11. does NOT place the application in condition for allowance because:

Applicants traverse the rejection of claims 1-11 and 15-19 under 35 § U.S.C. 102(e) as being anticipated by Hudson (US 5,912,792). Applicants argue Hudson does not expressly or inherently describe that any slurry disclosed therein is formulated to substantially concurrently polish copper and a barrier material, with the barrier material being removed at substantially the same rate as or at a slower rate than copper is removed. Applicants argue Hudson neither expressly nor inherently describe each and every element of Claim 1, under 35 U.S.C. § 102(a), therefore Claims 2-11 and 15-19, which depend from Claim 1, are allowable. Applicants further argue Hudson neither expressly nor inherently describes,

a slurry that is formulated to oxidize copper at substantially the same rate or at a faster rate than a barrier material is oxidized, in Claim 3;

a slurry in which copper and a barrier material have substantially the same oxidation energies, in Claim 4;

a slurry in which a barrier material has an oxidation energy of about 0.25 V more to about 0.20 V less than an oxidation energy of copper, in Claim 5;

a slurry in which a rate of removal of a barrier material is up to about ten times slower than a rate or removal of copper, in Claim 6;

a slurry in which a rate of removal of a barrier material is about two to about four times slower than a rate of removal of copper, in Claim 7; and

a slurry that is formulated to remove copper and a barrier material without substantially dissolving barrier material that underlies remaining portions of copper, Claim 8.

Applicants' arguments are acknowledged, but are unpersuasive because Hudson teaches a planarizing solution may be used to a titanium nitride barrier layer (column 4, lines 1-25) and copper (column 4, lines 50-52); has a pH of between 3.0 and 10.0 (column 4, lines 53-54); includes an oxidant such as ferric nitrate, hydrogen peroxide, potassium iodate, and bromine (column 4, lines 35-37 and 53-56); and has a mixture of 0.1%-1.0% benzotriazole, 0.1%-5.0% nitric acid, and deionized water (column 4, lines 56-65). The above read on,

A slurry for use in polishing a copper structure of a semiconductor device, the slurry being substantially free of abrasives.

Since Hudson uses a composition that is substantially free of abrasives as claimed by applicants, then using Hudson's slurry in the same manner as claimed in the present invention would inherently result in

the slurry being formulated to substantially concurrently polish copper and a barrier material with the barrier material being removed at substantially the same rate as or at a slower rate than copper is removed, in claim 1;

the slurry being formulated to oxidize copper at substantially the same rate as or at a faster rate than the barrier material is oxidized, in claim 3;

the slurry, the barrier material and copper have substantially the same oxidation energies, in claim 4;

the slurry, the barrier material has an oxidation energy of about 0.25 V more to about 0.20 V less than an oxidation energy of copper in said slurry, in claim 5;

the slurry, a rate of removal of the barrier material is up to about ten times slower than a rate of removal of copper, in claim 6;

the slurry, a rate of removal of the barrier material is about two to about four times slower than a rate of removal of copper, in claim 7; and

the slurry is formulated to remove copper and the barrier material without substantially dissolving the barrier material that underlies remaining portions of copper, in claim 8. NOTE: The rejection of claims 1-11 and 15-19 were made under "35 U.S.C. §102(e)" and not under 35 U.S.C. §102(a) as indicated by Applicants. However, the same response above for arguments presented for Claim 1 is applicable here.

Applicants traverse the rejection of Claims 12-14 and 21-25 under 35 U.S.C. §102(a) over Hudson (US '792) in view of Nakazato et al. (US 4,459,216) and argue the Claims are allowable, among other reasons, for depending directly or indirectly from Claim 1, which is allowable. The same response above for arguments presented for Claim 1 is applicable here.

As to claims 12-14 and 21-25, Applicants further argue Hudson teaches away from dissolving conductive material while oxidizing and polishing the same and Nakazato teaching a chemical dissolving solution having a good dissolving capacity for various kinds of metals is insufficient to overcome the fact that Hudson teaches away from the asserted combination. Hence, one would not be motivated to combine these references.

Applicants' arguments are acknowledged but are unpersuasive because the feature of dissolving conductive material while oxidizing and polishing the same is not required by the claimed invention. Applicants' arguments are also unpersuasive because the Nakazato reference is relied upon to cure Hudson's deficiencies by teaching an abrasive free solution comprising the specific concentration of oxidizer and complexing agent and operating temperature.

In response to Applicants' argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the reason for combining Hudson and Nakazato is to cure Hudson's deficiencies, in which the Nakazato reference is relied upon to teach an abrasive free solution comprising the specific concentration of oxidizer and complexing agent and operating temperature, which are known. Hence, it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Hudson by using Nakazato's concentration of oxidizer and complexing agent as well as temperature for the purpose of providing a chemical dissolving solution having good stability, a long life, and capability of producing a lustrous metal surface for use in chemical polishing (Nakazato, column 1, lines 5-6 and column 2, lines 33-37).

Applicants traverse the rejection of Claim 20 under 35 U.S.C. §103(a) over Hudson (US '792) in view of Suzuki et al. (US 5,5885,334) and argue Claim 20 is allowable, among other reasons, for depending directly or indirectly from Claim 1, which is allowable. The same response above for arguments presented for Claim 1 is applicable here.